



US005709879A

United States Patent [19]

Barchfeld et al.

[11] Patent Number: **5,709,879**[45] Date of Patent: **Jan. 20, 1998**[54] **VACCINE COMPOSITIONS CONTAINING LIPOSOMES**[75] Inventors: **Gail L. Barchfeld, Hayward; Gary Ott, Oakland; Gary A. Van Nest, El Sobrante, all of Calif.**[73] Assignee: **Chiron Corporation, Emeryville, Calif.**[21] Appl. No.: **469,444**[22] Filed: **Jun. 6, 1995****Related U.S. Application Data**

[63] Continuation of Ser. No. 308,622, Sep. 19, 1994, abandoned, which is a continuation of Ser. No. 154,160, Nov. 18, 1993, abandoned, which is a continuation of Ser. No. 722,862, Jun. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 546,585, Jun. 29, 1990, abandoned.

[51] Int. Cl.⁶ **A61K 9/127**[52] U.S. Cl. **424/450; 424/184.1; 424/204.1; 424/234.1; 424/812; 514/2; 514/937; 514/938**[58] Field of Search **424/450, 88-93, 424/184.1, 204.1, 234.1, 278.1, 812-832, 93.1; 514/937, 938, 18, 19, 2; 436/829**[56] **References Cited**

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Primary Examiner—Gollamudi S. Kishore
 Attorney, Agent, or Firm—Roberta L. Robins; Barbara G. McClung; Robert P. Blackburn

[57] **ABSTRACT**

A vaccine composition, comprising an antigenic substance in association with a liposome and an oil-in-water emulsion comprising a muramyl peptide, a metabolizable oil, and optionally an additional emulsifying agent. The two components of the adjuvant (i.e., the liposome/antigen component and the emulsion component) act together to produce high levels of immune response.

37 Claims, 7 Drawing Sheets